



NAVY DEPARTMENT

BUMED NEWS LETTER

a digest of timely information

Editor - Captain F. W. Farrar. (MC). U.S.N.

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Pulmonary Tuberculosis - Diagnostic Principles: The greatest handicap in the successful treatment of pulmonary tuberculosis is the fact that in the majority of cases when the disease is discovered the patients have far advanced lesions. The cause for this is two-fold: (1) the frequent absence of symptoms or, at least, of symptoms alarming enough to send the patient to the physician; and (2) the frequent failure of physicians to make the correct diagnosis.

The failure to diagnose tuberculosis results mainly from the failure to consider it. Contrary to the teaching of some twenty or thirty years ago, which regrettably still influences present practice, the diagnosis of pulmonary tuberculosis is not difficult. Essentially four steps are necessary:

1. To prove tuberculosis infection.
2. To prove the existence of a focus in the lung.
3. To prove that this focus is tuberculosis.
4. To prove that this focus is active.

Tuberculosis infection can be proved by an adequate tuberculin test. Whether or not it is worth while to include this first step depends on the reactor rate in the population group to which the patient belongs. It would be worth while in children, regardless of location and, for example, in farmers of up-State New York (with a reactor rate of around 30 per cent); it would not be worth while in workers in industrial cities with reactor rates reaching close to 100 per cent in adults.

The existence of a focus of tuberculosis in the lung can at times be proved by physical signs, but it is much more important to remember that the absence of a tuberculous focus can never be proved without adequate X-ray examination. This clearly imposes the definite and unavoidable obligation on every physician never to assure any person that he does not have pulmonary tuberculosis without a reliable X-ray examination. Once the suspicion of tuberculosis has, for whatever reason, arisen in the patient's or the physician's mind, it cannot be allayed without recourse to a roentgenological examination, which, in the case of all but a few especially trained experts, should be in the form of a roentgenogram. This has been preached and written so many times during the last one or two decades that it must have reached all physicians; but between specific knowledge and its specific practical application a wide gap still remains.

The only final proof that a pulmonary focal lesion is tuberculous is the demonstration of tubercle bacilli in sputum or gastric contents. Let it be repeated here, that tubercle bacilli prove not only the etiology but the activity as well. If tubercle bacilli cannot be found and the focus is apparently active, all differential diagnostic possibilities - chronic pneumonias, bronchiectasis,

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abscess, neoplasm, fungous infections, etc. - must be considered. Localization and morphological characteristics, clinical course and laboratory findings will help to establish the etiological diagnosis. Serial roentgenograms, films in various positions, tomograms, bronchograms and bronchoscopy may have to be marshalled according to specific indications. When after careful studies doubt still exists as to the specific diagnosis, any chronic focus, particularly in the upper third of the lung and especially in persons below the age of forty, must be considered tuberculous until proven otherwise.

Finally, activity is demonstrated by any of three criteria: (1) finding of tubercle bacilli, (2) changes on serial roentgenograms and (3) symptoms referable to the pulmonary focus. But the absence of all of these three criteria is no proof against activity. The decision of whether or not a demonstrated lesion in the lung is active is often more difficult than the diagnosis that such a focal lesion exists and that it is tuberculosis. In many cases the decision rests on the results of prolonged observation. Whether or not the patient should be kept in bed while the necessary observations are made depends on the potential vulnerability of the patient. This problem arises mainly in cases with lesions of minimal extent or in persons who already have undergone treatment. Judgment acquired by experience is more helpful than any written rules. For the protection of the patient, the assumption of activity of the pulmonary focus is, in doubtful cases, always safer than the hasty conclusion that no such activity exists.

The infinite variety of symptoms that pulmonary tuberculosis may cause confronts the physician with difficulties that are more apparent than real. Any deviation from optimal health existing for several weeks must arouse suspicion unless satisfactorily explained by other definite findings. Many cases of pulmonary tuberculosis would be diagnosed months and at times years earlier than they are, if it were not so frequently assumed that fatigue, poor appetite, chronic anemia, vague gastro-intestinal disturbances, recurrent headaches, and weight loss occur commonly without organic cause, and if it were realized that all these symptoms may be manifestations of active tuberculosis. The diagnosis, "chronic bronchitis" represents, in all but a slight fraction of cases, inertia, failure of proper examination or ignorance in the examining physician; too often this diagnosis disastrously misrepresents the patient's tuberculosis, or bronchial carcinoma. Symptomatic treatment without adequate diagnosis is a prominent cause of far advanced pulmonary tuberculosis.

The all too common tragedies of inadequate diagnostic work and incompetent therapeutic advice may well be summarized in the following quite typical, though composite, case report:

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"A girl, nineteen years of age, complains of slight fatigue and poor appetite in the late winter. Her physician, without any serious diagnostic attempts, prescribes high caloric diet, an expensive collection of vitamin pills and, when a few months later a hacking cough complicates the picture, he adds some cough medicine. Since no definite improvement results, ultraviolet radiation of the whole body is given three times a week. By the time the patient has developed a promising tan after three or four weeks of radiation treatment, she develops an acutely febrile disease. Now, for the first time, auscultation and percussion are set in motion and a consolidation of one of the upper lobes is suspected. The patient receives the sulfa drug which happens to be the most fashionable at the time, and is sent to a hospital. Since her fever is not influenced by the sulfa drug after five or six days, the diagnosis of virus pneumonia is made and confirmed by absence of pneumonococci in the sputum and a white count, neither markedly increased nor showing a polynuclear leukocytosis. Following a stay of two or three weeks in the hospital, during which time a roentgenogram confirms the presence of a pneumonic infiltration of the suspected upper lobe, the patient's temperature returns to normal or nearly normal. She is discharged, but her recovery is not complete. She is still weak, has lost weight, the sulfa therapy has not helped to improve her appetite and she is now evidently in need of a period of convalescence. She is sent to the mountains, where, with little elan, she takes walks, eats as much as her unenthusiastic appetite permits, goes to an occasional dance in the evening and, according to prescription, 'takes all the sun she can get.' Her impressive tan and the pleasures of this leisurely life make her feel better, until one day she has a hemoptysis of moderate size which frightens her to such an extent that she returns to the city, where now, six months after the symptomatic onset and a few weeks after her hemorrhage, a roentgenogram is taken and there is now seen some nodular infiltration of the left apex, a moderately large cavity in the left subclavicular region and a recently disseminated (post-hemoptotic) spread in the right lower lobe. Now, finally, a sputum examination for tubercle bacilli is made. It shows acid-fast bacilli on direct smear."

In retrospect, the pathological-clinical correlations are obvious. One roentgenogram, taken at the very beginning of the history and competently interpreted, would have prevented the entire disastrous course.

The necessary diagnostic procedure is simple and should become standardized routine.

The diagnostic problem is frequently difficult in so-called asymptomatic patients whose pulmonary lesions are accidentally discovered. With service induction and separation examinations, and large-scale service and civilian diagnostic surveys, this type of problem is becoming of greatest importance.

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It is the twofold problem of differential diagnosis and activity diagnosis. The next few years should bring forth the reports of many studies in this field.

During recent years, 91 patients were observed in the author's sanatorium in whom the diagnosis was made "accidentally," in draft examinations, in surveys, in pre-employment examinations, etc. All these patients were not aware of having any disease at the time of the diagnosis. This, however, is not equivalent to saying that they all were asymptomatic, but they were not conscious of symptoms significant enough to cause them to seek medical advice. Either at the time of diagnosis or prior to it, 59 (65 per cent) of these 91 patients had symptoms, and 16 more developed symptoms while under observation. This leaves only 16 (17.5 per cent) of this group of 91 patients who were truly asymptomatic. All but 5 of the patients were finally judged to have active disease. In only 28 of the group, or slightly less than one-third, was the disease minimal in extent. Roentgenological changes in serial roentgenograms, either progressive or retrogressive, proved the lesions to be active in 78 (90.7 per cent) of the active cases. Positive bacteriological findings were obtained in 77 (89.5 per cent). It is important to point out that even in the group of 28 minimal cases, 26 of which were active, tubercle bacilli were found in 20 (77 per cent) of the active cases.

Symptoms, roentgenological evidence of an unstable lesion and positive bacteriological findings were all of high diagnostic value, each being present in close to 90 per cent of all active cases. Compared with this, an elevated sedimentation rate occurred in only 63 per cent of the active patients and a leukocytosis of more than 9,000 in only 43 per cent.

These findings bring into sharp relief the practical evaluation of criteria for the diagnosis of activity, showing the high degree of reliability of serial roentgenograms, observation of symptoms and bacteriological findings, and the relatively low degree of reliability of such hematological data as sedimentation reaction and white count.

("Pulmonary Tuberculosis in the Adult", Max Pinner, M.D. Published by Charles C. Thomas, Springfield, Illinois, 1945)

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Epidemic Influenza B: During the recent epidemic of influenza B, numerous patients with acute febrile respiratory infections were hospitalized for study. It was found that the majority of such patients showed evidence of pulmonary consolidation on X-ray examination. It was not possible on the basis of detailed clinical, roentgenological, and the usual bacteriological

and hematological studies to determine which patients had primary atypical pneumonia and which had influenza B. Appropriate serological tests readily distinguished between the two infections, however, as also did the recovery of influenza B virus from some patients with the latter disease. Patients with influenza B virus who had pulmonary consolidation developed antibodies against influenza B virus and did not develop antibodies against influenza A virus, streptococcus MG, or the particular type of pneumococcus isolated from their upper respiratory tracts. Moreover they did not possess cold hemagglutinins against group O erythrocytes. Patients with primary atypical pneumonia either developed antibodies against streptococcus MG, showed cold hemagglutinins, or both, and did not develop antibodies against influenza A virus or influenza B virus.

Present evidence indicates that pulmonary consolidation may develop in influenza B and strongly suggests that the virus is responsible for the observed lung lesions. (OEMcmr-117, Horsfall, Rockefeller Inst. M. Res. - CMR Bulletin #74)

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Acute Myocarditis in Mumps (Epidemic Parotitis): Mumps (epidemic parotitis) is generally regarded today as an acute systemic disease of virus origin, having a special predilection for the parotid glands. Among the complications most familiar to the physician are acute orchitis, pancreatitis, meningitis and meningoencephalitis. Cardiac involvement has been considered rare and when observed has been described as either acute pericarditis or acute endocarditis.

The author, having observed two isolated cases of mumps complicated by acute myocarditis with electrocardiographic evidence of complete heart block, undertook a study of the electrocardiographic findings in a consecutive series of 104 patients with mumps admitted to a hospital during the height of an epidemic. The study was to serve as an approach to the determination of the incidence, course, and prognostic significance of acute myocarditis due to the virus of mumps. For 46 of these patients serial ECG's were made at intervals of from two to four days. In sixteen of the 104 patients (15.4 per cent) electrocardiographic evidence of myocardial involvement consisting of the following abnormalities was found:

In four patients the P waves became diphasic or inverted in one or more leads. Prolongation of the P-R interval was found in two instances. In one person, the QRS complex in CF₄ became inverted, and in another the voltage in the limb leads decreased. Two patients showed significant elevation of the

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S-T segments in CF₄, and in one of these, the S-T segment was bowed upward. In one subject, the S-T segment became depressed beyond normal in leads II and III. Changes in the T waves were observed in all the 16 patients, and in two of these they were noted in two or more leads. The T waves became tiny, diphasic or inverted, and by means of the serial electrocardiographic studies the evolutionary stages in the development of T wave inversion could be demonstrated. Alterations of the T wave occurred with essentially the same frequency in each of the four leads. In 14 out of the 16 patients, more than one abnormality was found. In the other two, significant changes in the T wave were found in either lead I or lead II. No specific electrocardiographic pattern was recognizable in this study.

In 14 patients, the electrocardiographic changes returned to normal in from two to thirty-five days.

Precordial pain, dyspnea and/or palpitation appeared in four cases of this series and in the two isolated cases.

The results of this study indicate that:

1. Myocardial involvement is not a rare event during the course of epidemic parotitis in adults.
2. Electrocardiographic evidence of myocardial involvement, when present, appears as a rule between the fifth and tenth days of illness and in this respect is similar to acute orchitis and meningoencephalitis.
3. Mumps myocarditis is usually mild and transitory, and in the majority of instances it follows a subclinical course and is recognizable chiefly, if not exclusively, by electrocardiographic studies.
4. It is possible to find electrocardiographic evidence of myocardial involvement due to the mumps virus without clinical signs of parotitis.
5. Some of the symptoms observed during convalescence from mumps may be related to a disturbed myocardial physiology.

(Arch. Int. Med., Nov.-Dec. '45 - Rosenberg)

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Some Aspects of Surgery of the Stomach and Duodenum: Doctors Counsellor, Waugh, and Claggett in the "Report of Surgery of the Stomach and Duodenum for 1944" of the Mayo Clinic point out their methods of treating the commoner disorders of the stomach and duodenum amenable to surgery and indicate their trends in the choice of certain surgical procedures. Nine hundred fifty-six operations were performed on a total of 943 patients.

Gastric Ulcer: During the five years previous to 1944, approximately 60 per cent of patients who had gastric ulcer were treated surgically. In 1944, surgically-treated cases decreased to 44 per cent, probably because some patients, unable to leave their positions or homes, had to forego either operation or hospitalization. It was predicted that the percentage of patients treated surgically will rise steadily until there will remain only those for whom the risk of operation outweighs the chance of the lesion being malignant.

Unquestionably many gastric ulcers are cured by non-surgical management, but a benign ulcer cannot always be distinguished from a cancerous one by its therapeutic response. Malignancy in a gastric ulcer cannot always be detected roentgenologically, nor can the nature of the lesion, even in the gross specimen, be decided upon invariably. It has been shown by routine microscopic examination of all ulcerating lesions of the stomach surgically removed that 10 per cent of those on the lesser curvature, 40 per cent of those in the prepyloric region and 96 per cent of those on the greater curvature are malignant (Dockerty).

The authors favor the view that operation is the least hazardous course for the patient who has a gastric ulcer and who is otherwise in reasonably good condition. Their reasoning is based upon the considerations that a benign gastric ulcer cannot be distinguished from a cancerous one except with the aid of a microscope, that 10 per cent of ulcers in the most favorable region of the stomach prove to be malignant on surgical excision and that the chance of a malignant lesion being present is more than ten times the risk of partial gastrectomy for its removal.

<u>Type of Operation</u>	<u>Cases</u>
Partial Gastrectomy	122*
Excision and gastro-enterostomy or gastroduodenostomy	3
Total Gastrectomy	2
Gastro-enterostomy	1
Partial Gastrectomy for simultaneous gastric ulcer and duodenal ulcer	24

*Five cases of gastritis without ulcer are included.

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Gastric Malignant Lesions: Of the patients on whom a diagnosis of malignant lesion of the stomach was decided upon, 60 per cent were treated surgically. The other 40 per cent of these patients presented lesions that were so obviously inoperable that exploration was considered undesirable. The patients operated upon numbered 298, of whom 288 had been diagnosed as having carcinoma and 10 as sarcoma. Of those undergoing operation, 40 per cent submitted only to exploration or a conservative palliative procedure, and 60 per cent had a resection. The reporting doctors state that this was the highest resectability rate in the history of the clinic and expressed the hope that the upward trend will continue as a result of people becoming more and more aware of the significance of vague gastric symptoms and seeking medical attention earlier.

<u>Type of Operation</u>	<u>Cases</u>
Exploration	112
Partial Gastrectomy	151
Total Gastrectomy	21
Gastro-enterostomy	14

It is remarked that there had been a large increase in the overall number of total gastrectomies performed in 1944 and the previous year despite the fact that lesions in the cardia formerly requiring abdominal total gastrectomy had been removed during the past 3 years by transthoracic partial gastrectomy.

Duodenal Ulcer: In contrast to gastric ulcer, the management of duodenal ulcer is primarily nonsurgical. The percentage of patients in whom duodenal ulcer was diagnosed and for whom operation was performed decreased from 28 per cent in 1930 to 20 per cent in 1934 and further to 12 per cent in 1944. This trend is looked upon as a wholesome one, for only rarely does the question of malignancy arise in connection with ulcerating lesions of the first portion of the duodenum.

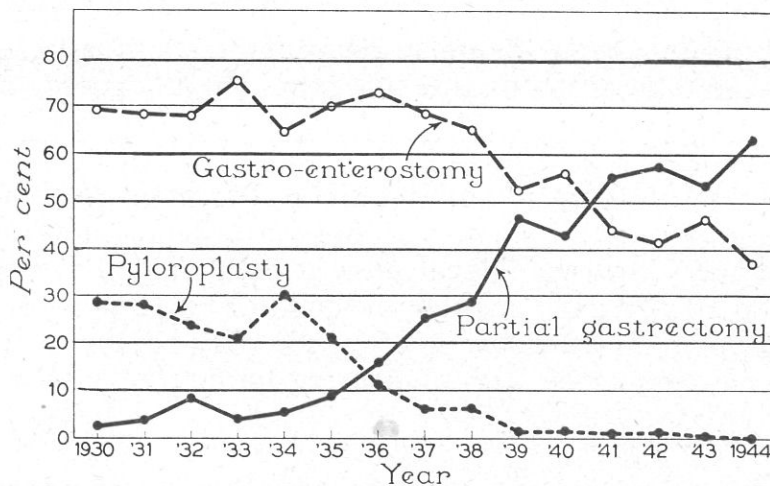
Only patients with complications such as hemorrhage, obstruction and perforation, or whose ulcers are intractable to a strict regimen, are advised to undergo operation.

Of 337 patients operated upon, 63 per cent had a partial gastrectomy and 37 per cent had a gastro-enterostomy. The authors believe that gastro-enterostomy has a place in the surgical management of complicated duodenal ulcer and use it frequently with satisfactory results for elderly patients presenting obstruction. Partial gastrectomy has been chosen in the treatment of hemorrhagic ulcers and of ulcers seen in young persons who have abnormally high acidity following a test meal.

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<u>Type of Operation</u>	<u>Cases</u>
Acute Ulcer	
Closure of acute perforation	12
Closure of excision of acute perforation with gastro-enterostomy	3
Subacute and Chronic Ulcer	
Partial gastrectomy	192
Posterior gastro-enterostomy	118
Anterior gastro-enterostomy	12

This chart pictures the changes that have occurred in the choice of operations during the fifteen-year period ending with 1944:



Other Conditions: The various procedures utilized for patients with jejunal ulcer, gastrojejunitis, gastric or duodenal ulcer in the presence of a gastro-entero-anastomosis and with malfunctioning gastro-entero-anastomoses were as follows:

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<u>Type of Operation</u>	<u>Cases</u>
Partial gastrectomy and disconnection of gastro-enteric stoma	
For jejunal ulcer	43
For gastrojejunitis	11
For gastric ulcer and duodenal ulcer	6
For malfunctioning gastro-enteric stoma	3
Disconnection of gastro-enteric anastomosis and excision of ulcer	4
Disconnection of gastro-enteric anastomosis and gastroduodenostomy	2
Disconnection of gastro-enteric anastomosis and new gastro-enterostomy	2
Disconnection of malfunctioning gastro-enteric anastomosis	5

Adequate preoperative preparation including preparation of the colon and the use of sulfasuxidine is considered of great importance in dealing with gastrojejunocolic fistula, for these patients are usually in a poor nutritional state. (Proc. Staff Meet. Mayo Clin., Jan. 9, '46)

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Treatment of Myopia by Visual Training: In the spring of 1944, the Curtis Publishing Company offered to finance an investigation of the merits of widely publicized methods of visual training in the treatment of myopia.

As a result of this offer a study of the system sponsored by the Graduate Clinic Foundation of St. Louis was planned. The Director of the Foundation who went to Baltimore and established a clinic for the purpose of the study summarized the training as follows:

"The visual training rests on the postulate that seeing is a learned act and is therefore susceptible to training. A system of differential analysis was

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employed to discover the type of distorted pattern resulting from undesirable visual practices. Spheres, cylinders, prisms and targets were employed in this training program with the idea of reorganizing the visual behavior patterns so that the visual skills, including acuity, can be improved significantly. This method of visual training has neither in theory nor practice any relation to the so-called Bates theory, and in theory and practice it involves no deviation from the known and accepted theories and facts of physiology and neurology of the eye or the experimental psychology of vision. It has its inception in the work of optometrists, stemming from the standard literature on learning. The records of this development from its start exist in the optometric literature, and are covered in the papers of Doctors George Crow and Harry Fuog, S. K. Lesser, Leslie B. Burdette, Marguerita Thoma Eberl and others, in the Optometric Extension Program, articles on training in the files of the 'Optometric Weekly,' the 'American Journal of Optometry,' and other publications."

It was arranged that the Wilmer Institute, serving without financial support of any agency connected with the project, would act as judge. In so doing the Institute would make a preliminary examination of the candidates for training, reject those considered unsuitable, make examinations of the subjects after the training had been completed, and report its findings and conclusions in a recognized medical periodical before a report or reference of any kind would be made by the other parties to the agreement concerning the results.

Careful arrangements were made to assure an unbiased study and report of the findings and conclusions.

Four test charts were used. Each test observation on the Snellen scale was reduced to percentage visual acuity, using the tables computed in Dr. A. C. Snell's book on Medico-Legal Ophthalmology.

One hundred and three myopic individuals were selected from a total of 130 applicants. They were then returned to the Director of the Graduate Clinic Foundation for a course of visual training designed to improve their uncorrected vision.

Upon completion of the final examinations the results were studied. It was found that 30 of these patients, or 29 per cent, showed a low-grade improvement on all charts. This improvement averaged an increase of 27 points in the percentage visual acuity. A second group of 31 patients, or 30 per cent, did not show a consistent improvement on all four charts but did show an overall improvement in both eyes which averaged 14.7 points increase in the percentage visual acuity. As far as could be determined, the improvement in these two groups was not consistently maintained. A third group of 32 patients, or 31 per cent, showed practically no change in the percentage visual acuity. A

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fourth group of 10 patients, or 9 per cent, showed a decrease in the percentage visual acuity of 10.8 points.

The changes in the percentage visual acuity noted were found to lie within the limits of error of subjective testing of the visual acuity. Also the estimating of change on the basis of percentage visual acuity weights the scales in favor of improvement in high myopes.

The maximum average increase noted in Group I was between one and three lines of improvement in the Snellen scale. It was believed by the examiners that education in the correct interpretation of a blurred visual image was the chief factor in the improvement noted in this group. It was further believed that the exercises produced a beneficial psychological reaction in certain patients towards their visual handicap, regardless of whether an actual improvement in visual acuity had occurred.

With the possible exceptions of educating some patients to interpret blurred retinal images more carefully and of convincing some others they could see better even though there was no actual improvement, this study indicates that the visual training used on these patients was of no value for the treatment of myopia. (Tr. Am. Acad. Ophth., Nov.-Dec., '45 - A. C. Woods)

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Pneumothorax in Young Adult Males: Reports on large numbers of cases of spontaneous pneumothorax have usually been drawn from clinics or sanatoriums dealing with tuberculous patients. These reports consequently have been biased to a certain extent in the direction toward tuberculosis.

Among the military personnel in the Army Air Forces Training Command a study of 126 patients with 129 episodes of spontaneous pneumothorax was made. Since this group of patients could not be considered a general sample of the adult male population, and since in addition this group had been screened for pulmonary disease (chiefly pulmonary tuberculosis) prior to entrance into the Service on active duty, the results observed in this study are biased in the opposite direction, namely, away from tuberculosis.

This study brings to the fore spontaneous pneumothorax per se. In a study by Hall similar cases of pneumothorax were designated "spontaneous pneumothorax in healthy adults."

The following observations were made from the study of this group, heavily weighted with the nontuberculous type of spontaneous pneumothorax:

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Not infrequently the onset may be gradual rather than sudden. Initial symptoms are frequently absent or mild in degree and vague or atypical. In 85 out of 100 cases the onset of the attack occurred when the patient was at rest (48.6 per cent) or during mild physical activity (37.8 per cent).

A positive or suggestive history of previous pulmonary disease is not usually found (an idiopathic pneumothorax).

The side on which pneumothorax occurs is more frequently the right. In this group, the right side was involved in 59.8 per cent of the cases. The closed type of pneumothorax is most common. The degree of collapse is often less than one-third, and on the average the air can be expected to be absorbed in about twenty days in those who have less than 50 per cent pulmonary collapse.

The immediate or remote cause of this type of pneumothorax is still unsettled. The theories, spontaneous rupture of a weakened portion of the pleura, tearing of pleural adhesion, rupture of subpleural emphysematous blebs, interstitial emphysema leading to a subpleural collection and finally rupture and wearing through of the pleura through the process of normal denudation, have not been disproved. Conversely, none of these theories can be strongly advocated on the basis of the observations in this study. The theories of a tearing of a pleural adhesion or rupture of an emphysematous bleb are not supported by these cases, since residual pleural adhesions and emphysematous blebs could not be demonstrated on the roentgenograms. However, judging from the work of others, the rupture of an emphysematous bleb still seems the most likely immediate cause. In addition, there was no demonstrable association with pulmonary tuberculosis.

Except in a long-time study of a large number of cases, inferences concerning the degree of tendency for pneumothorax to recur are not valid.

So far as these data are concerned, there is no demonstrable relation between spontaneous pneumothorax and the performance of duties incident to aviation.

Complications are not frequent and not particularly dangerous if treated by standard procedures. Three out of four patients were salvaged for further military duty. (Arch. Int. Med., Nov.-Dec. '45 - J. E. Leach)

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Information on Field Tests with Sodium Fluoroacetate (1080): From a study of field tests carried out in the state of Texas, Cox reports findings which suggest an increased usefulness of this poison.

Rodent Control: Sodium fluoroacetate (1080) in water was used successfully in rodent control operations despite the simultaneous presence of over-sufficient unpoisoned clean water.

The results of one operation indicated that Norway rats may have a greater tolerance for 1080 than Alexandrine rats. Following exposure to 1080-poisoned bait, 38 dead Alexandrine rats were recovered; and approximately 12 hours later, 16 dead Norway rats were found. It was assumed that both types of rats had access to, and ate equal amounts of poisoned bait; yet the Norway rats survived longer.

Insect Control: As an insecticide, most spectacular results were reported in fly killing by use of the following: sawdust soaked in a solution of 1080 (1/8 oz. per gal.) containing sufficient honey added to give slight sweetness. This blend was placed in cheesecloth bags, suspended, and drained until the cloth surface was slightly damp. These bags were then hung in desired locations, much in the manner that fly-paper rolls are used. (N.R.C. Abstract Bulletin #29, Series A, of the Insect Control Committee Coordination Center)

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Study of Certain Factors in Application of DDT Sprays: Tests were conducted with DDT sprays applied from a helicopter against adult mosquitoes. The purpose of the tests was to determine the effect of the time of application, particle size, and concentration of DDT on the results of the spraying treatments. It was found that spraying at midday was just as effective as spraying at dawn, except that lower immediate results were obtained with coarse particles applied at midday. In general, particle size had no effect on results. When applied at the same dosage of DDT per acre, a smaller spray volume of a 20 per cent solution was just as effective as the usual spray volume of a 5 per cent solution. This is of much practical importance since it shows that the area treated per load of spray can be increased 4 times without any reduction in the effectiveness of the treatment.

The helicopter used in these tests is not considered practical for routine control work, but further developments in this type of aircraft probably will permit its satisfactory use for this purpose. (OSRD M-4331, Yuill et al., U. S. Dept. of Agriculture, MS. for publication - CMR Bulletin #74)

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Fly Control with DDT: Effective fly control in mess halls at Camp Gordon, Georgia, resulted from painting all screens with 5 per cent DDT during May, July, and September, and spraying garbage racks monthly.

To determine the best crystalline formation of DDT on screens, 5 per cent DDT was applied to sample screens by painting, dipping, spraying, or spraying with backing provided behind the screen. Examination 3 days later revealed that painting produced both longer individual crystals and thicker clusters of crystals. The time required for a four-man crew to treat the screens averaged: painting, 10 min.; dipping, 20 min.; spraying, 7 min.; and spraying with backing, 18 min. On the basis of the time, labor, and residual action resulting from crystalline formations, painting with wide-shouldered brushes was selected as the most favorable method of application. (N.R.C. Abstract Bulletin #29, Series A, of the Insect Control Committee Coordination Center from Bulletin U.S. Army M. Dept., '46)

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Protection Against Scrub Typhus: On a South Pacific island three infantry units were successively sent into an endemic scrub typhus area. The 1st unit used no miticide-treated clothing; the 2nd unit (with the exception of some troops) had all clothing sprayed with dimethyl phthalate (DMP); the 3rd unit (2-1/2 times larger than either of the other two) used uniforms impregnated with an emulsion of 5 per cent DMP. Occurrence of scrub typhus was as follows: 45 cases in 1st unit, 16 in 2nd, and 7 in 3rd. Thus the incidence in the 3rd unit was only 1/15 that of the 1st unit and 1/5 that of the 2nd unit. (N.R.C. Abstract Bulletin #29, Series A, of the Insect Control Committee Coordination Center from Bulletin U.S. Army M. Dept., '46)

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Report on a Lookout Training Program: The medical officer of a CVL while operating with a task force in and around Japanese waters noted that an increasing number of men complaining of sore eyes had been reporting to the sick bay. Examination revealed these men to have a conjunctivitis which varied in degree from mild to severe. Because most of these men were performing lookout duty and were exposed to the direct and reflected rays of the sun, it was concluded that the condition was one of "sunburned eyes." In some cases the visual acuity was temporarily reduced as much as twenty-five per cent, and in most cases, because of the pain and irritation, difficulty was experienced in keeping the lids open without using an ophthalmic analgesic. The reason for the undue exposure to the sun's ray seemed to be that during

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moderately rough weather, hazy weather with dampness and much glare, and even highly humid weather, the sunglasses worn by the lookouts tended to smear with fine salt spray or steam up, so that the men removed their glasses while on watch in order to be able to see.

Because visual acuity in lookouts was considered to be an essential by the ship, a "Special Lookout Training Program" formulated by the medical officer was approved and made a ship's order by the commanding officer. This program was based on the following:

1. Eye examinations with emphasis placed upon visual acuity, muscle balance, and any existing pathology.
2. Educational measures including lectures on: (a) the anatomy and physiology of the eye as applied to day and night vision, (b) the correct method of scanning under different degrees of illumination with emphasis on the twilight and dawn periods, (c) "Good Vision and How to Protect It," stressing the general physical condition, adequate rest including eye rest and special diets with explanation of the part played by vitamins in the maintenance of good vision.
3. Protective Measures:
 - (a) Sunglasses provided when the sea was calm and the relative humidity was low.
 - (b) Visor caps, and lamp black or burnt cork under the eyes and over the area of the malar prominence to protect them against reflected rays during rough seas when salt spray interfered with use of sunglasses or during conditions of haze and increased glare, or during hot weather with relative high humidity.
 - (c) Red lens dark adaptation glasses used on all lookouts for one-half hour immediately before assuming night watches. Men went to duty station wearing the glasses and those men being relieved returned the glasses for the use of men next taking the watch.

The whole program was directed toward the attainment and maintenance of good vision - how to use it correctly, and how to protect it to produce efficiency.

The medical officer reported that there were no cases of sunburned eyes during this operation after the program was started, that visual acuity was

(Not Restricted)

maintained at the highest level and that the officer in charge of the lookouts reported that his men showed more enthusiasm for their work and took a special interest in the protection of one of their valuable physiological assets - good vision.

As a result of this program, it was felt that the ship and crew experienced an appreciably increased protection against enemy attacks; and because of the interested cooperation of those concerned it was considered that the program was easily initiated and easily carried out successfully.

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(Not Restricted)

Effect of Aspirin on Dark Adaptation: Because of the fact that aspirin is so widely accepted and so frequently used with and without medical advice, Seitz, while on the staff of a medical school, undertook to determine the effect of this drug on dark adaptation.

Using the Hecht adaptometer and the procedure recommended by Hecht and Schlaer, the author concluded from the results obtained that aspirin in 10 grain doses has no significant effect on the course of dark adaptation. For this reason he considered that aspirin employed in the dosage studied will not impair night vision. (Lt. C. P. Seitz, H(S): USNR)

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(Not Restricted)

Studies Concerning Sea Disasters: The reports on experiences of personnel incident to disasters at sea during the war are being studied with a view toward the development and adoption of new or improved materiel and method further to protect and preserve human life during and following such emergencies.

Remedies will be sought for the deficiencies which have been shown to exist and for any that careful consideration may expect to result from future technological advances.

It is requested that those who may have ideas or suggestions or definite recommendations in this connection send them in, addressed to the Bureau of Medicine and Surgery, Attention: Research Division.

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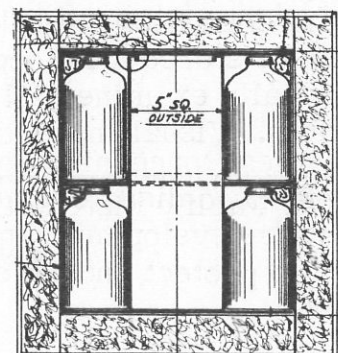
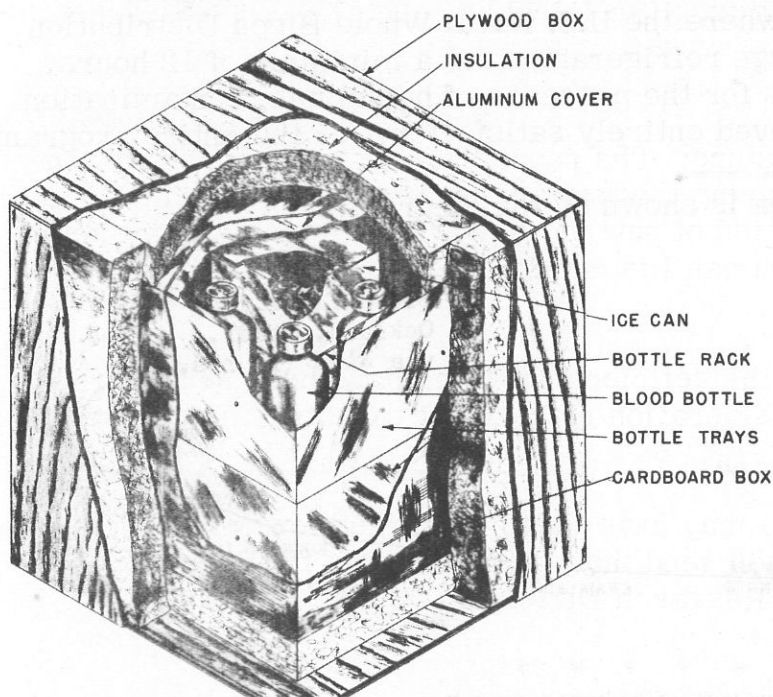
(Not Restricted)

The Distribution and Use of Human Whole Blood in the Pacific War: The preservation, refrigeration and distribution of human whole blood from the United States into the tropical areas and combat zones constitute one of the major advances of modern medicine in World War II.

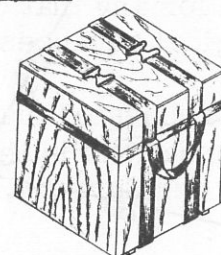
In preparation for war, and during the early phases of combat, human dried plasma and albumin were made available to the United States forces in adequate amounts, but it was not long before the need for large amounts of whole blood became evident in both theaters of the war.

The first large shipments of whole blood from the United States donor centers started in August 1944 for the European Theater and in November 1944 for the Pacific Theater.

The problems of distance, tropical conditions, preserving solution, standard equipment and practical studies on transported blood had to be solved prior to undertaking the Pacific distribution. Distances were overcome through the assignment by high authority of a number 1 air priority for the transportation of all whole blood shipments. The refrigeration was maintained through the medium of a 5.9 cubic foot box cooled with water ice. It was developed especially for the purpose through the Naval Medical Research Institute and is shown in cut-away diagram.



SIXTEEN STERILE EXPENDABLE
BLOOD RECIPIENT SETS. PACKED
AS SHOWN.



BOX COMPLETE WITH STRAPS

**LIGHTWEIGHT EXPENDABLE REFRIGERATOR
FOR TRANSPORTING WHOLE BLOOD BY AIRCRAFT**

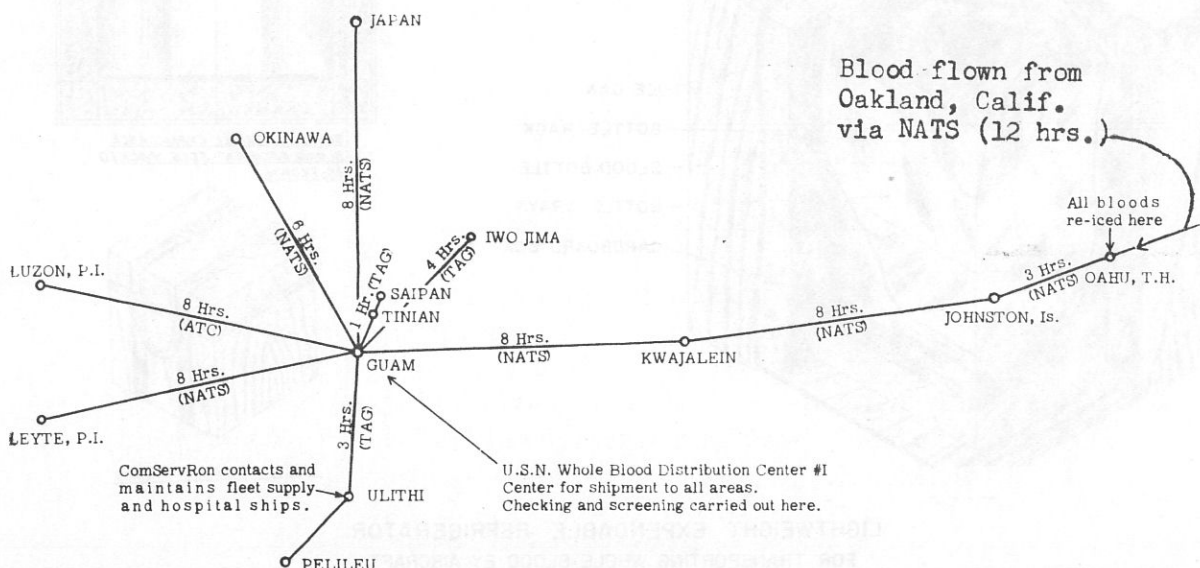
(Not Restricted)

Very minor modifications suggested through extensive experience were in process but canceled following V-J day. This box, containing 16 pints of whole blood, would be kept at a temperature from 8 to 10 degrees Centigrade for as long as 50 hours. A new preservative anticoagulant known as the acid-citrate-dextrose or Loutit-Mollison solution enabled blood to be stored and utilized up to the 21 days as planned from the date of bleeding and even longer in emergencies, although use after storage for more than 21 days is undesirable. Standard donor and recipient equipment was set up with the 600 c.c. blood bottle containing 480 c.c. of blood, and 120 c.c. of anticoagulant solution. Finally, studies on transported blood of from 4 to 31 days old gave early assurance of the safety and practicability of this projected distribution and use.

The procurement of the blood for the program was made the responsibility of the American Red Cross with the bleeding and processing placed under the technical supervision of the Army and Navy. The program for the European Theater of Operation was under Army control and that of the Pacific Theater under the Navy. New West Coast centers were opened to meet the Pacific demands but following the cessation of hostilities in Europe the East Coast also contributed to the Pacific Theater.

In the operation of the program, all the blood was flown by the Naval Air Transport Service from Oakland, California to Honolulu. There it was re-iced and then flown on to Guam where the U.S. Naval Whole Blood Distribution Center #1 stored all blood in large refrigerators for a minimum of 12 hours, and visually examined all bottles for the presence of hemolysis, contamination and clots. Visual inspection proved entirely satisfactory for the entire program.

The Pacific distribution area is shown by the diagram.



(Not Restricted)

Statistical data revealed that 177,784 pints of whole blood were received at Guam from the United States, that a total of 171,564 pints were reshipped and that a 3.4 per cent overall loss from various causes was registered at the distribution center at Guam. The total weight of all shipments to Guam was 966,700 pounds or 483.35 tons, and required a total of 65,557 cubic feet of plane space for the shipments.

Data on distribution showed 93,086 pints to the Philippine Islands during the campaign there, 16,224 pints to Iwo Jima, 44,802 to Okinawa, 18,068 to the various hospital ships and 4,508 to other fleet units.

Information relating to the use of the blood was gathered on a small postal-card type of report form. Altogether, 21,296 reports were returned with the occurrence of reactions recorded on 676, a reaction rate of 3.1 per cent.

In "A" and "B" recipients, the reaction rates were above those in type "O" recipients, thus seeming to lend weight to the desirability of adding A and B group-specific substances to type "O" blood in order to neutralize the isohemagglutinins present.

The reaction rates were graded as to the various types of the injury treated and the rates were higher as the degree of tissue injury increased. The cases of severe hookworm anemia receiving transfusions of type "O" blood had the highest reaction rate, namely, 7 per cent. (Lt. Comdr. Herbert R. Brown, Jr., USNR - MS. for publication)

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(Not Restricted)

Abstracts of Reports on Research Projects: (Full reports are available upon request.)

X-109F Carrying Straps for Pole Litters.

A simple, inexpensive strap for helping litter bearers to carry their burden more easily has been designed. It does not supplant the use of the arms in carrying the litter, but affords the bearer a chance to rest his arms completely or to take part of the weight of the litter off his arms.
(N.M.R.I., N.N.M.C., Bethesda, Md.)

(Not Restricted)

X-227

Design and Construction of a Nylon Armored Suit for Protection of Fuze-Stripping Personnel of the Bureau of Ordnance.

A jacket, helmet and gloves have been designed and constructed of NFD 202/1 (flexible nylon) to protect fuze-stripping and AQE (Ammunition Quality Evaluation) personnel against explosions of detonators and other component parts of fuzes.

Ballistic tests performed at the Ordnance Investigation Laboratory, Naval Powder Factory, Indian Head, Maryland, have demonstrated the effectiveness of flexible nylon in stopping the penetration of fragments. (N.M.R.I., N.N.M.C., Bethesda, Md.)

X-436

Oxygen Poisoning in Man: Effect of Cysteine Hydrochloride and Ammonium Chloride on the Time of Onset of Toxic Symptoms.

Nine divers breathed 99 per cent oxygen in a recompression chamber at a gauge pressure of 44.5 pounds per square inch two hours after (1) no medication, (2) 1.0 Gm. of ammonium chloride, (3) 0.25 Gm. of cysteine hydrochloride, (4) 0.7 mg. of quinine sulfate (control) and (5) 1.5 Gms. of cysteine hydrochloride.

The drugs used did not significantly alter the interval from the start of oxygen breathing until the onset of signs or symptoms of oxygen poisoning (oxygen tolerance time). (N.M.R.I., N.N.M.C., Bethesda, Md.)

X-480

Comparison and Evaluation of the "Pseudo-Isochromatic Plates for Testing of Color Perception," American Optical Company, Second Edition with the First Edition of these Plates now in General Use by the United States Navy.

To compare the first and second editions of the Pseudo-Isochromatic Color Plates, published by the American Optical Company, 212 men were tested with both editions.

It was found that the average number of hesitations per plate and the average time per plate was greater in the second edition, but that because of fewer plates the total time of administration was approximately the same as for testing with the first edition. It was concluded that

(Not Restricted)

X-480
(Cont.)

(1) several plates remain in the second edition that should be modified or eliminated because they contribute very little to the differentiation of subjects who make a large number of errors and those who make a small number of errors, and (2) although many cues have been eliminated in the second edition, a method of memorization still exists. (Medical Field Research Lab., Camp Lejeune, N.C.)

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"Summaries of Research," Naval Medical Research Institute: Attention is invited to this report which covers the research and tests reported upon during the last six months of 1945. Copies may be obtained upon request.

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(Not Restricted)

Reduction of Critical Score for Release of Medical Officers: Alnav 76 of 14 February announces reductions in critical scores applicable on 15 April and 2 May. Male officers classified MC on 15 April change to 45; on 2 May change to 44.

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(Not Restricted)

Transfer to Regular Navy: The attention of officers of the U. S. Naval Reserve is called to NAVACT 18 of 6 February 1946, appearing in the Navy Department Bulletin of 15 February as Circular Letter 46-352, and which is included in this issue.

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(Not Restricted)

Bumed News Letter to Inactive Medical Department Reserve Officers to Continue Indefinitely: As a result of many requests from Reserve officers of the Medical Department being released from active duty, the Surgeon General has approved a recommendation that the sending of the Bumed News Letter to all Naval Reserve officers of the Medical Department with designation MC, DC, and H(S) in an inactive duty status be continued for an indefinite period beyond the six months announced in the 4 January issue of the Letter.

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(Not Restricted)

Refresher Course in Pediatrics: For the purpose of assisting in bringing potentially useful information to medical officers who have been or soon will be released from active duty, the following is announced:

The Michael Reese Hospital Post Graduate School, with the cooperation of the members of the Department of Pediatrics, University of Chicago and Loyola University School of Medicine will offer a refresher course in Pediatrics. The course will be held in the Michael Reese Hospital, 29th Street and Ellis Avenue, Chicago 16, Ill., beginning May 1 and lasting until May 29, 1946. The hours will be from 9:00 a.m. to 5:00 p.m. daily. The tuition fee will be \$100.00.

It not being possible for the Navy to order reserve officers to this course while on active duty or otherwise defray any expense incident to such training, it is necessary that those officers who may wish to enroll make arrangements directly with the Michael Reese Hospital.

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(Not Restricted)

Dental Engine Handpieces: The necessity for returning all unserviceable dental engine handpieces to the Brooklyn Naval Medical Supply Depot for repair and reissue no longer exists.

Unserviceable dental engine handpieces may be repaired locally or surveyed and disposed of locally, but are not to be returned to the U. S. Naval Medical Supply Depot, Brooklyn, N. Y. (Chief, Materiel Div., BuMed)

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(Not Restricted)

An Otosclerosis Service: The U. S. Naval Hospital, Bethesda, Maryland, has been designated a center for the surgical treatment of otosclerosis by fenestration of the labyrinth. (See the Navy Department Semimonthly Bulletin of 31 March 1946, and page 29 herein for a copy of the Circular Letter which officially established this service as of 20 March 1946.)

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Circular Letter 46-50

(Not Restricted)
BUMED-D-ALS
P14-2/OD
1 March 1946

To: All Ships and Stations.

Subj: Examination of Candidates for Appointment in Dental Corps of the Navy.

1. Professional examinations for appointment in Dental Corps, U. S. Navy will be held on 19 August 1946.

2. Examinations are open to eligible civilians, recent graduates, and Reserve Officers. This is an opportunity for Reserve Officers with less than 6 months' active duty in commissioned rank to qualify for appointment before billets become filled.

3. Applications should be forwarded in accordance with Part 1, Chapter 3, Section II, Manual of the Medical Department (Rev. 1945).

--BuMed. Ross T. McIntire.

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NAVACT 18

(Not Restricted)
BuPers (3P1)
6 February 1946

Subj: Transfer to Regular Navy.

Refer BuPers Circ. Ltr. 288-45, of 15 November 1945, and Alnav 395-45.

Former states that officers who apply for transfer to the Regular Navy while on active duty will remain on active duty while their applications are pending. Officers in this category may, at their own request and without withdrawing their applications, be separated provided they are otherwise eligible for release. Commanding officers are authorized to request release orders from order-writing commands for such officers. Their applications will continue to be considered unless individually withdrawn at the applicant's own request. Officers who are ordered to inactive duty under the provisions of this Navact should be advised that they will lose precedence commensurate with the period between end of terminal leave and their appointment in the Regular Navy unless their request for return to active duty is received by their local naval district or river command prior to the expiration of terminal leave.

--SecNav. H. Struve Hensel.

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(Not Restricted)

Disestablishment of Naval Medical Activities. As published in the Navy Department Semimonthly Bulletin of 28 February 1946, the following Naval Medical activities were disestablished as of the dates shown:

<u>Name</u>	<u>Address</u>	<u>date of disestablishment</u>
U. S. Naval Special Hospital	Glenwood Springs, Colorado	1 May 1946

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(Not Restricted)

ALNAV 84

BuMed.

15 February 1946

Subj: Human Blood Plasma and Serum Albumen.

Alnav 231-44, Alnav 231-45, and Alnav 281-45 canceled. Allowances for human blood plasma, Medical Department stock number S1-3531, established as follows: All naval vessels exclusive of yard craft and reserve fleets with complement of 200 or less, 4 units per 100; Complement of 200 to 1,000, 3 units per 100; Complement of 1,000 and above, 2 units per 100; AH type vessels, 500 units; APH type vessels, 300 units. Allowances for small bases and stations outside continental United States same as for vessels based on complement as above. Fleet Marine Force under expeditionary conditions allowance is 12 units per 100 complement.

Allowances for serum albumen, Medical Department stock number S1-1945, established as follows: AH and APH type vessels, 210 units each; Fleet Marine Force under expeditionary conditions, 6 units per 100 complement. Serum albumen available to naval hospitals and large dispensaries on NavMed Form 4 for use in treatment of hypoproteinemias and shock only.

Reserve stocks of human blood plasma and serum albumen retained in medical-supply facilities in Pacific Ocean areas not modified. All blood plasma and serum albumen above allowances established hereby shall be returned to the nearest medical supply facility.

--SecNav. W. John Kenney.

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(Not Restricted)

ALNAV 88

BuMed.

18 February 1946

Subj: Transfer to Medical Corps, Regular Navy.

In order that applications of Reserve medical officers for transfer to the Medical Corps of the Regular Navy may be reviewed for immediate appointment as soon as legislation authorizing such transfers is enacted, medical

(Not Restricted)

officers of the Naval Reserve are urged to consider transfer to the Regular Navy and forward immediately to BuPers via air mail their completed applications in accordance with BuPers Circular Letter 288-45.

--SecNav. James Forrestal.

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Circular Letter 46-46

(Not Restricted)

BuMed-MC-PV

P14-2/OM(054)

25 February 1946

To: All Ships Continental.

Subj: Professional Examination for Appointment as Assistant Surgeon, U. S. Navy.

Ref: (a) Alstacon 142320, of Feb. 1946.

(b) Alstacon 211455, of Feb. 1946.

(c) BuPers Circ. Ltr. 288-45 (Revised); N. D. Bul. of 15 Nov. 1945, 45-1639.

1. The Bureau of Medicine and Surgery has been authorized to convene boards of medical examiners and supervisory examining boards at continental U. S. naval hospitals during the period of 6 to 10 May 1946 for the examination of eligible candidates for appointment to the Medical Corps of the Regular Navy in the grade of assistant surgeon, rank of lieutenant (jg), (MC) USN. (Refs. (a) and (b).)

2. This examination will make it possible for medical officers of the U. S. Naval Reserve who have not completed 6 months active duty in commissioned rank and therefore not eligible to file application for transfer to the Regular Navy in accordance with the provisions of reference (c), to qualify for appointment in the Medical Corps of the Regular Navy.

3. Medical officers of the U. S. Naval Reserve scheduled to report for active duty during April 1946 following completion of civilian intern and specialty training will represent the major source of potential candidates. Addressees having cognizance of such personnel are urged to bring to their attention this opportunity to demonstrate their professional qualifications for appointment to the Medical Corps of the Regular Navy and advise eligible candidates to communicate with BuMed at the earliest practicable date for detailed information and procedure of application.

--BuMed. W. J. C. Agnew.

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Circular Letter 46-52

(Not Restricted)

BUMED-Y-DFS

P3-3/P3-1

13 Mar 1946

To: MedOfCom, NavMedSch, NNMC, Bethesda, Md,
MedOfCom, NavHosps, (Chelsea, Mass., Great
Lakes, Ill., Long Beach, Calif., Oakland, Calif.,
Philadelphia, Pa., San Diego, Calif., Seattle, Wash.,
St. Albans, N. Y.)

Subj: Photofluorographic Equipment, Use in Connection with U. S. Navy
Training Program in the Teaching Centers.

Refs: (a) BuMed Cir. ltr no. 46-3, 4 Jan 1945.

(b) Report of Proceedings of the Advisory Board to the Surgeon
General dated 1 Feb 1946.

1. Arrangements are being made to transfer to each of the addressees a photofluorographic unit complete with automatic camera and automatic phototimer, medical catalog #S5-1587, for use in connection with the training of roentgenologists, chest specialists and x-ray technicians, and for the examination of the chests of all Naval and Marine Corps personnel required by ref (a). If dark room equipment, other than that required for the processing of 35 mm film, will be required this Bureau should be notified, giving details.

2. Delivery of this equipment will be made when it is no longer required by the Personnel Separation Centers.

3. Ref (b) reads, in part, as follows:

“(a) Roentgenologists and chest specialists in the Navy shall be trained in the interpretation of photofluorographic film, making photofluorographic training an allied duty of roentgenologists and chest specialists and not a limited field in itself.

“(b) X-ray technicians should also receive training in photofluorographic techniques.”

--BuMed. Ross T. McIntire.

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Circular Letter 46-53

To: AlNavStas.

(Not Restricted)
BUMED:WR:MC
P4-4/P3-2(DEAF)
20 Mar 1946

Subj: Otosclerosis Service U. S. Naval Hospital, Bethesda,
Maryland, establishment of.

Ref: (a) BuMed Cir ltr 45-77, 20 Mar 1945, paragraph 2c.

1. The U. S. Naval Hospital, Bethesda, Maryland, has been designated a center for the surgical treatment of otosclerosis by fenestration of the labyrinth.

2. Authorization to transfer patients in naval hospitals in whom a diagnosis of otosclerosis has been established, to the U. S. Naval Hospital, Bethesda, Maryland, for surgical treatment will be requested from the Bureau in accordance with current directives when the following conditions prevail:

(a) There is a bilateral hearing loss of the conduction type of at least 40 decibels average loss through the speech frequency range from 256 to 2048 double vibrations per second. Should the hearing loss be unequal in the two ears, with the average loss in speech frequency range of less than 40 decibels in one ear, the average loss in the second ear must be sufficiently greater than 40 decibels to produce an average loss of 40 decibels as between the two ears.

(b) The bone conduction as measured by the bone conduction audiogram and by the Rinne test shall be normal or very slightly reduced for the tones of the speech frequency range.

(c) The patient desires this surgical treatment.

3. The foregoing modifies reference (a) only as regards patients whose deafness results from otosclerosis and who meet the criteria set forth above.

4. Requests for authorization to transfer patients to the U. S. Naval Hospital, Bethesda, Maryland, for surgical treatment of otosclerosis shall be restricted to personnel on the active list of the Navy and Marine Corps, retired personnel on active duty, and members of the Reserve on active duty.

5. Personnel who are performing duty and who meet the criteria set forth in paragraph 2 above should be admitted as patients to the nearest naval hospital with a view to transfer to the U. S. Naval Hospital, Bethesda, Maryland,

(Not Restricted)

for treatment. Dispensaries are not authorized to request transfer of patients to the U. S. Naval Hospital, Bethesda, Maryland for surgical treatment of otosclerosis.

--Billed. Ross T. McIntire.

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